ASSIGNMENT 1

Textbook assignment: Chapter 1, "Test Equipment Administration and USE," pages 1-1 through 1-33. Chapter 2, "Miscellaneous Measurements," pages 2-1 through 2-27.

1-1. What system is currently used by U.S. military services to identify electronic equipment with standardized nomenclature?

1. Joint Electronic Type Designation System (JETDS)
2. Joint Electronics Type Category System (JETCS)
3. Army-Navy (AN) System
4. Navy Tactical Data Systems (NTDS)

1-2. Which of the following categories of test equipment is/are designed to test, without modification, a range of electronic parameters needed for two or more systems that are different in design?

1. GPETE
2. SPETE
3. Both 1 and 2 above
4. Installed

1-3. For what purpose was the ETE classification board established?

1. To control inventory limits
2. To control the increase of nonstandard GPETE
3. To control the increase of nonstandard SPETE
4. To become final approval authority for SPETE

1-4. Which of the following systems provides an inventory of test equipment actually located in the fleet?

1. 3M
2. SCLSIS
3. STEED
4. SPETREL

1-5. You can determine if a piece of test equipment has been calibrated by checking which of the following documents?

1. The test equipment logbook
2. A directive from the EMO
3. The completed maintenance action form for the instrument
4. A tag or label attached to the instrument

1-6. What label is used to identify a test instrument that is within tolerance on all parameters?

1. INACTIVE
2. CALIBRATED
3. CALIBRATED—Refer to report
4. ORGANIZATION LEVEL CALIBRATED

1-7. Which of the following conditions warrants the use of one of the SPECIAL CALIBRATION labels and/or tags?

1. Calibration deviates from the usual tolerances
2. The instrument has more than one calibration interval
3. The instrument is too large to move and requires in-place calibration
4. Each of the above

1-8. Under what circumstances should the USER CALIBRATION label be affixed to a piece of test equipment?

1. When a certain calibration schedule is assigned
2. When user calibration is required before, during, or after use
3. When the equipment is out for calibration
4. Each of the above

1-9. Which of the following statements must appear on the CALIBRATION NOT REQUIRED label affixed to an instrument?

1. By what authority the label was affixed
2. The reason no calibration is required
3. The date the label was affixed
4. The METRL page number

1-10. Which of the following labels is attached to an unusable instrument, and may have an additional tag attached?

1. INACTIVE
2. REJECTED
3. CALIBRATED
4. SPECIAL CALIBRATION

1-11. A test instrument that has plug-in modules and/or easily accessible potentiometer or controls which affect the calibration of the instrument should have which of the following labels attached?

1. CALIBRATED
2. CALIBRATION NOT REQUIRED
3. CALIBRATED—REFER TO REPORT
4. CALIBRATION VOID IF SEAL BROKEN

1-12. A replacement part needed by an IMA to repair a piece of test equipment should be ordered by the activity sending the inoperative equipment for repair and calibration. For which of the following reasons is this a good practice?

1. IMAs are not allowed to order repair parts
2. The ship has more repair funds than the IMA
3. The ship is usually able to obtain the parts more quickly
4. It is more likely the technician on the ship will obtain the correct part

1-13. When maintenance personnel are not authorized to make repairs to a piece of test equipment, what items, if any, must be sent to the calibration repair facility with the equipment?

1. The unit and its power cord
2. All the accessories
3. Standards used to calibrate
4. None

1-14. In what type of environment should test equipment be stowed?

1. Dry
2. Dark and damp
3. High humidity and low temperature
4. High temperature and high humidity

1-15. In a stowage space aboard ship, what device(s) should be used to hold the test equipment in place?

1. Set clasp springs
2. Tie down cord
3. Steel straps
4. Stretch seat-belt-type straps

1-16. What system is used to provide for a standardized recall and scheduling of test equipment into calibration facilities?

1. MDCC
2. SCLSIS
3. METER
4. MEASURE

1-17. The meter card is used to provide what information concerning test equipment?

1. Changes
2. Additions
3. Deletions
4. All of the above

1-18. Which of the following actions would be classified as preventive maintenance?

1. Purchasing a new piece of test equipment
2. Isolating an equipment failure to the component level
3. Aligning a servo assembly after a repair
4. Replacing a defective transistor

1-19. Which of the following actions would be regarded as part of corrective maintenance?

1. Routine lubrication of a radar pedestal
2. Mechanical inspection of a bearing assembly in a motor housing
3. Alignment of a servo assembly after a repair
4. Cleaning a filter in accordance with a maintenance requirement card

1-20. Troubleshooting electrical and electronic equipment includes which of the following actions?

1. Fault isolation
2. Equipment repair
3. Equipment performance evaluation
4. Each of the above

1-21. The initial operating conditions of newly installed equipment are referred to as

1. alignment data
2. manufacturer's specifications
3. baseline operating characteristics
4. expected operation characteristics

1-22. When working on energized equipment, you should follow which of the following practices?

1. Work alone
2. Work with both hands
3. Insulate yourself from ground
4. Wear rubber gloves at all times

1-23. When measuring 300 volts or more, you should first take what step?

1. Turn off equipment power
2. Ground all components capable of retaining an electrical charge
3. Short-circuit all components capable of retaining an electrical charge
4. Connect the meter leads to the points to be measured

1-24. Which of the following insulating materials is suitable for covering a grounded metal work bench?

1. Dry insulating material that contains no holes or conductors
2. Dry canvas that has holes in it
3. Dry phenolic material that has conductors embedded in it
4. Damp plywood

1-25. Prior to working on a circuit, you use a shorting probe discharge which of the following types of components?

1. Capacitors only
2. Cathode-ray tubes only
3. Capacitors and cathode-ray tubes
4. Inductors

1-26. If a 28 volt 6 ampere fuse blows, the proper procedure is to replace it with which of the following devices?

1. A larger fuse until the cause of the overload has been determined
2. A fuse of the same voltage and current rating
3. A fuse rated 20 percent lower than the blown fuse
4. A copper strap until the cause of the overload is determined

1-27. Before electrical equipment is overhauled or repaired, what general safety precaution, if any, should be followed?

1. The fuse for the associated circuits should be replaced with circuit breakers
2. The main supply switches should temporarily be shorted out
3. The power switches should be secured open and tagged out of service
4. None

1-28. After work on equipment is complete, who should remove any attached tags?

1. The job inspector
2. The repair crew leader
3. Any member of the repair crew
4. The person who signed and attached the tag

1-29. What is the purpose of the grounding cable attached to the frame of a generator aboard ship?

1. Create a potential difference between the frame and the ship
2. Conduct power to the generator under emergency conditions
3. Ensure equipment is at same ground potential as the ship
4. Break the circuit between the frame and the power supply under emergency conditions

1-30. Which of the following steps should you take to help ensure that metal-case test equipments are safe to use?

1. Energize the instrument to test the ground
2. Ensure the equipment is grounded
3. Insulate the metal case from ground
4. Connect all metal cases to a common ungrounded lead

1-31. Which of the following precautions should you observe when using measuring instruments?

1. Avoid strong magnetic fields
2. Avoid excessive current
3. Avoid mechanical shock
4. Each of the above

1-32. The meter movement in a voltmeter can be easily damaged by excessive current if you do not follow certain procedures. When setting up the meter to read voltage, the RANGE SWITCH should first be set to (a) what relative range and then changed to (b) what relative range?

1. (a) Highest
   (b) Closest to the voltage to be read
2. (a) Highest
   (b) Lower than the voltage to be read
3. (a) Lowest
   (b) Lower than the voltage to be read
4. (a) Lowest
   (b) Closest to the voltage to be read

A.	Place one hand in your pocket or behind your back.
B.	Turn on the power.
C.	Connect the meter ground to the equipment ground.
D.	Place the positive meter lead on the test point; select for positive or negative polarity.

Figure 1A.—Procedures

IN ANSWERING QUESTION 1-33, REFER TO THE PROCEDURES IN FIGURE 1A.

1-33. When you measure voltages less than 300 volts, in what order should you complete the task?

1. A B C D
2. B C D A
3. C A D B
4. D C B A

IN ANSWERING QUESTIONS 1-34 THROUGH 1-37, SELECT FROM THE MEASUREMENT COLUMN BELOW THE ANSWER THAT MATCHES THE SITUATION BEING DESCRIBED.

MEASUREMENT

1. Current
2. Inductance
3. Resistance
4. Capacitance

1-34. This measurement is rarely taken in preventive or corrective maintenance or testing because unsoldering is usually required. Ohm's law is normally applied to determine this value.

1-35. This is a valuable aid in locating faults during corrective maintenance, but cannot be made with power applied. Many technical manuals contain charts that indicate the test points for this measurement.

1-36. This measurement provides an indication of dielectric strength and is used to determine the power factor.

1-37. This measurement is seldom taken during troubleshooting. It can be taken using a bridge or another instrument that is primarily designed to measure another quantity; however, a conversion chart is required.

1-38. The power factor is an indication of the losses caused by which of the following conditions?

1. Excessive voltage
2. Dielectric absorption
3. Current leakage
4. Both 2 and 3 above

1-39. The Wheatstone bridge can be used for precision measurements of which of the following quantities?

1. Voltage
2. Current
3. Impedance
4. Resistance

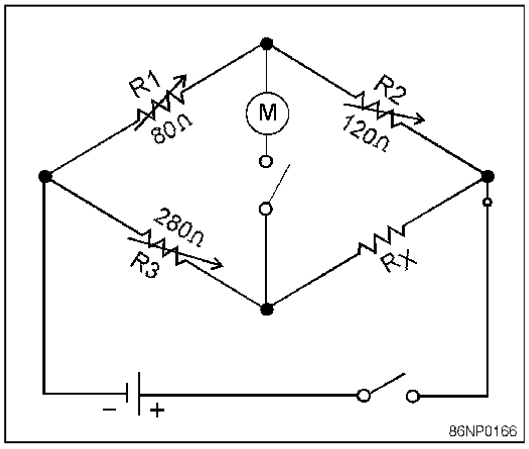

Figure 1B.—Dc resistance bridge.

IN ANSWERING QUESTION 1-40, REFER TO FIGURE 1B.

1-40. In the dc resistance bridge, what is the value of Rx?

1. 42 ohms
2. 400 ohms
3. 420 ohms
4. 4,200 ohms

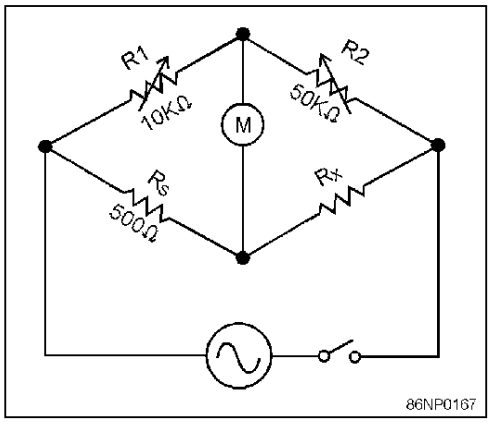

Figure 1C.—Ac resistance bridge.

IN ANSWERING QUESTION 1-41, REFER TO FIGURE 1C.

1-41. In the ac resistance bridge, what is the value of R_x?

1. 25 ohms
2. 250 ohms
3. 2,500 ohms
4. 25,000 ohms

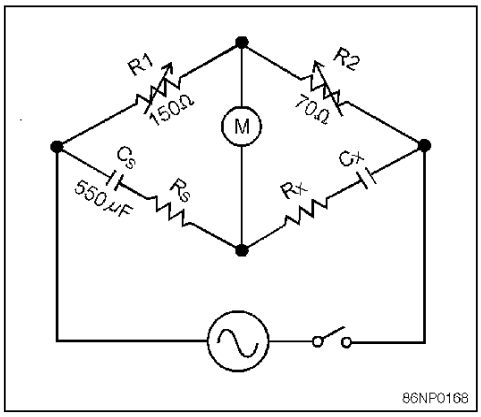

Figure 1D.—Capacitance bridge.

IN ANSWERING QUESTION 1-42, REFER TO FIGURE 1D.

1-42. In the capacitance bridge, what is the value of C_x?

1. 25 microfarads
2. 117 microfarads
3. 256 microfarads
4. 1,178 microfarads

1-43. Dc power is stated in which of the following units?

1. Watts
2. Farads
3. Amperes
4. Henries

1-44. Power in an audio-frequency circuit is stated in which of the following units?

1. Decibels (dB) only
2. Decibels referenced to 1 milliwatt (dBm) only
3. Both dB and dBm
4. Volt units (Vu)

1-45. The bel is a unit of measurement used with voltage, current, or power that compares which of the following circuit values?

1. The input to the output
2. The output to a reference
3. The voltage to power
4. The current to power

1-46. What is the relationship between the values of the bel and the decibel?

1. The bel is twice the decibel
2. The decibel is twice the bel
3. The bel is 1/10 the decibel
4. The decibel is 1/10 the bel

1-47. What is the corresponding increase in dBm each time power is doubled?

1. +1 dB
2. +2 dB
3. +3 dB
4. +10 dB

1-48. A thermocouple ammeter is used to measure which of the following quantities?

1. Rf current
2. Af current
3. Motor current
4. Generator current

1-49. A bolometer is a power meter that measures power in certain frequency ranges. Which of the following methods is/are used by the bolometer to measure power values?

1. A barretter detects increases in power when its resistance increases
2. A thermistor detects increases in power when its resistance decreases
3. Both 1 and 2 above
4. Power is measured directly

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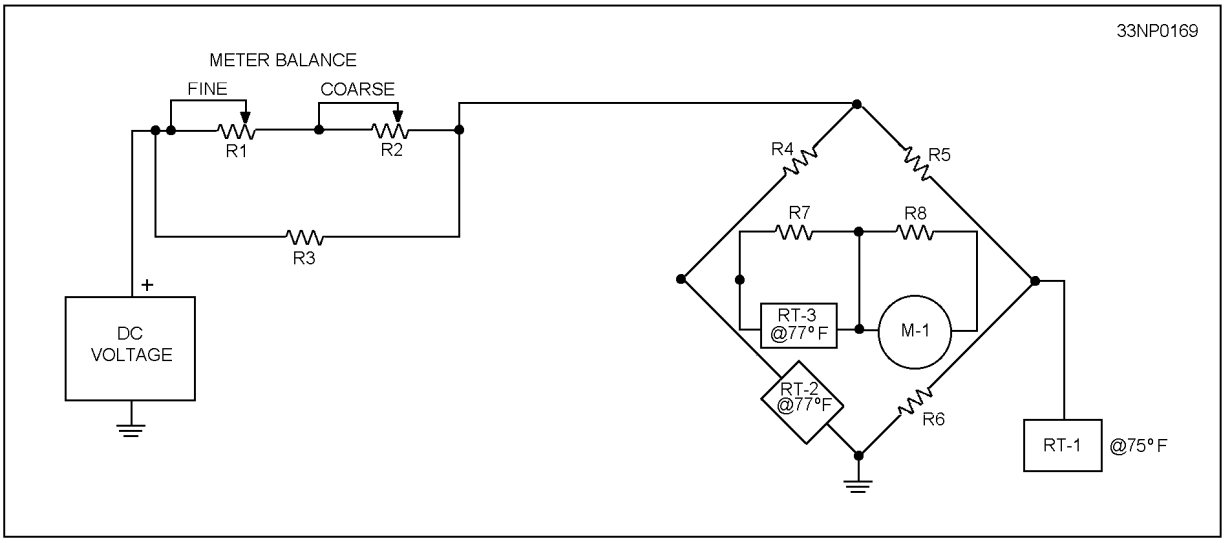

Figure 1E.—Thermistor bridge.

IN ANSWERING QUESTION 1-50, REFER TO FIGURE 1E.

1-50. In the thermistor bridge, what is the purpose of RT-1 and RT-3?

1. To compensate for power used by RT-2
2. To compensate for temperature changes outside the waveguide
3. To control the amount of rf energy applied to RT-2
4. To control the temperature of the waveguide

1-51. To measure shaft rotation rate on an engine, you should use, which, if any, of the following instruments?

1. An ammeter
2. A bolometer
3. A tachometer
4. None of the above

1-52. In the centrifugal tachometer, what component restricts the action on the lower collar that is produced by centrifugal force?

1. The spring
2. The pointer
3. The upper collar
4. The lower collar

1-53. What is the usual speed range (in feet per minute) of a chronometric tachometer?

1. 0 to 30
2. 0 to 300
3. 0 to 3,000
4. 0 to 30,000

1-54. You are measuring the speed of a fan blade by using a stroboscopic tachometer. Setting the flash at a rate 5 rpm SLOWER than the fan speed will cause the blades to appear to move (a) in what relative direction and (b) at what speed?

1. (a) Forward (b) 5 rpm
2. (a) Forward (b) 10 rpm
3. (a) Backward (b) 10 rpm
4. (a) Backward (b) 5 rpm

1-55. The flashing rate of a strobotac is controlled by which of the following circuits?

1. An electronic pulse generator
2. A frequency divider
3. A power supply
4. An amplifier

1-56. The flashing rate of the strobotron tube affects its life expectancy. What is the range (in hours) of life expectancy of the strobotron tube?

1. 15 to 24
2. 25 to 49
3. 50 to 99
4. 100 to 250

1-57. The vibrating-reed frequency meter is a delicate instrument and should not be subjected to vibrations, such as those associated with motor-generators or their associated control panels.

1. True
2. False

1-58. When using the vibrating-reed frequency meter, you take the reading in which of the following ways?

1. Read the digital readout
2. Read the dial indication
3. Read the mechanical setting
4. Read the reed that vibrates the most

1-59. Bandpass filters and band reject filters are tuned circuits that either pass or reject specific frequencies. In these filters, (a) what type offers very high impedance to currents at its resonant frequency, and (b) what type offers a very low impedance to currents at its resonant frequency?

1. (a) Parallel-tuned (b) series-tuned
2. (a) Parallel-tuned (b) parallel-tuned
3. (a) Series-tuned (b) parallel-tuned
4. (a) Series-tuned (b) series-tuned

1-60. When you are zero beating an unknown frequency with a frequency provided by a calibrated, high-precision oscillator within a heterodyne frequency meter, what will be the indication when the two frequencies are matched?

1. One dot of light on the screen will be superimposed on the other
2. One vertical line on the screen will be superimposed on the other
3. The two tones in the headset will achieve the same pitch, at which time a series of clicks will begin
4. The tone in the headset will decrease in pitch and be replaced by clicks that will become slow or nonexistent

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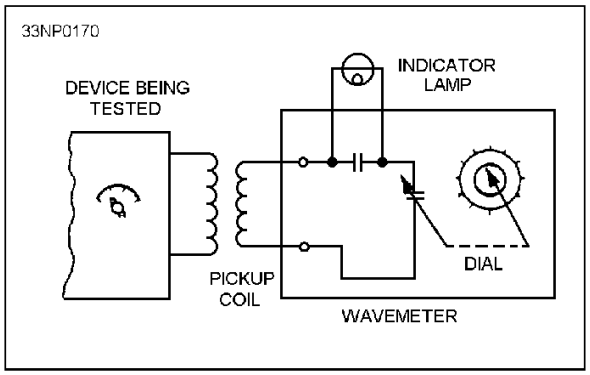

Figure 1F.—Absorption wavemeter circuit.

IN ANSWERING QUESTION 1-61, REFER TO FIGURE 1F.

1-61. When you are using an absorption wavemeter to measure frequency, the greatest accuracy may be obtained by loosely coupling the pickup coil so that the indicator lamp burns (a) with what degree of brilliance (b) under what resonance condition?

1. (a) Maximum brilliance (b) when tuned to the resonant frequency
2. (a) Maximum brilliance (b) when not tuned to the resonant frequency
3. (a) Dimly (b) when not tuned to the resonant frequency
4. (a) Dimly (b) when tuned to the resonant frequency

1-62. Which of the following instruments should be used to accurately measure a frequency in the shf range?

1. Absorption wavemeter
2. Resonant, cavity-type wavemeter
3. Resonant, coaxial-line-type wavemeter
4. Both 2 and 3 above

1-63. In a cavity wavemeter, moving the plunger farther into the cavity space causes which of the following changes to (a) the cavity size and (b) the resonant frequency of the cavity?

1. (a) Decrease (b) increase
2. (a) Decrease (b) decrease
3. (a) Increase (b) decrease
4. (a) Increase (b) increase

1-64. For which of the following purposes is a cathode-ray oscilloscope used?

1. To measure microwave energy
2. To visually analyze waveforms
3. To provide frequency modulation
4. To locate stray radio interference

1-65. The synchroscope contains which of the following circuits?

1. Retrace blanking circuit
2. A wide band amplifier
3. A trigger sweep
4. All of the above

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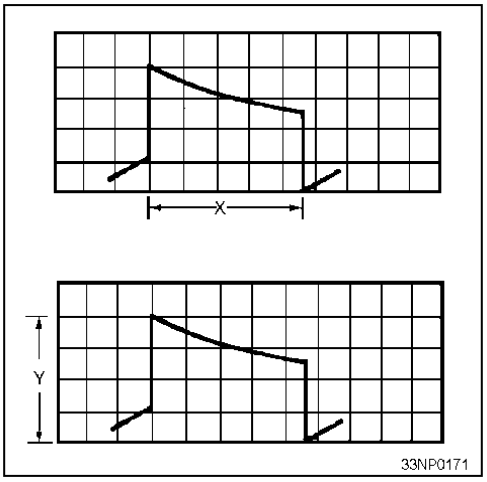

Figure 1G.—Waveform display.

IN ANSWERING QUESTION 1-66, REFER TO FIGURE 1G. MEASUREMENT X REPRESENTS THE HORIZONTAL DISTANCE OF THE WAVEFORM; MEASUREMENT Y REPRESENTS THE VERTICAL DISTANCE OF THE WAVEFORM.

1-66. In the figure, (a) time is represented by what measurement, and (b) amplitude is represented by what measurement?

1. (a) X (b) X
2. (a) X (b) Y
3. (a) Y (b) Y
4. (a) Y (b) X

1-67. An oscilloscope measures voltage and displays waveforms. It can be used to measure currents, temperatures, speeds, and accelerations if they are first converted to

1. heat
2. light
3. voltages
4. pressures

1-68. The spectrum analyzer is used to display which of the following quantities?

1. Amplitude within each frequency component in a circuit
2. Proportions of power within each frequency component in the spectrum
3. Frequencies produced in a circuit
4. Each of the above

1-69. While testing a semiconductor diode, you determine that the forward resistance value is 60 ohms. You should consider the diode good if the backward resistance is at least which of the following values?

1. 6 ohms
2. 60 ohms
3. 600 ohms
4. 6,000 ohms

1-70. When you are using an oscilloscope to test a crystal diode, what is shown by (a) the vertical deflection and (b) the horizontal deflection?

1. (a) Crystal current
   (b) voltage applied to the diode
2. (a) Crystal current
   (b) power developed in the diode
3. (a) Crystal voltage
   (b) power developed in the diode
4. (a) Crystal voltage
   (b) voltage applied to the diode

1-71. When you are using the oscilloscope to test the Zener diode, what is represented by (a) vertical deflection and (b) horizontal deflection?

1. (a) Zener current
   (b) Zener power
2. (a) Zener current
   (b) applied voltage
3. (a) Applied voltage
   (b) Zener power
4. (a) Applied voltage
   (b) Zener current

1-72. When troubleshooting transistorized circuits, you should first check the condition of which of the following circuits?

1. Counters
2. Amplifiers
3. Oscillators
4. Power supplies

1-73. Which of the following instruments is used to check transistors for collector leakage current and current gain?

1. Ohmmeter
2. Voltmeter
3. Wheatstone bridge
4. Semiconductor test set

1-74. When making base-to-emitter bias voltage checks on a transistor, you should read which of the following voltage ranges?

1. 5 to 20 microvolts
2. 50 to 200 millivolts
3. 5 to 20 volts
4. 50 to 200 volts

1-75. When making resistance measurements on a transistor with an ohmmeter, you should allow what maximum current in the transistor?

1. milliampere
2. milliampere
3. microampere
4. microampere